AppleScript and UNIX Scripting for System Administrators

AppleScript, Shell, Perl, Python

Session 615

These are confidential sessions—please refrain from filming or taking pictures.

Enterprise IT

AppleScript and UNIX Scripting for System Administrators

AppleScript, Shell, Perl, Python

Joel Rennich
Consulting Engineer
Enterprise Consulting Services

http://developer.apple.com/wwdc2005/

Heterogeneous Networks

http://developer.apple.com/wwdc2005/

Overview

- Script options in OS X
- AppleScript
- Shell
- Perl
- Python
- Loads of cool scripts!

What Script?

http://developer.apple.com/wwdc2005/

Scripting Languages in OS X 10.4

- AppleScript
- Shell—sh, tcsh, zsh, bash, and now ksh!
- Perl
- Python
- Ruby
- tcl
- php
- expect

Others Not Installed with OS X 10.4

- Smalltalk
- F-script
- Frontier
- Real BASIC
- Many, many others

Picking a Scripting Language

- Does it do what you need?
- Do you know the language?
- Will you be able to run it where you need to?
- Most scripting languages will be able to do most things. Some will do it better than others, but all will probably get you where you want to be in the end

What Scripting Isn't

- Not just a "hack" job. Many scripts are more full featured than applications
- Not a replacement for network administrators
- Not always faster than an application, but almost always faster to develop

How to Start Scripting

http://developer.apple.com/wwdc2005/

Get a Problem

- Very hard to just “script” if you don’t know where you’re going to go
- Real problems will force you to create real solutions
- Script will actually be usefull

Get a Script

- AppleScript or Shell easiest to start with
  - AppleScript if you are more GUI-based
  - Shell if you are more CLI-based
- Leave Perl, Python and the other languages until you've got your feet wet

Get the Tools

- Script Editor or 3rd party AppleScript editors
  - Script Debugger from Late Night Software
  - Face Span
- Most any text editor for Shell
  - vi, emacs, pico
  - BBEdit
  - Sub Etha Edit
  - Text Edit

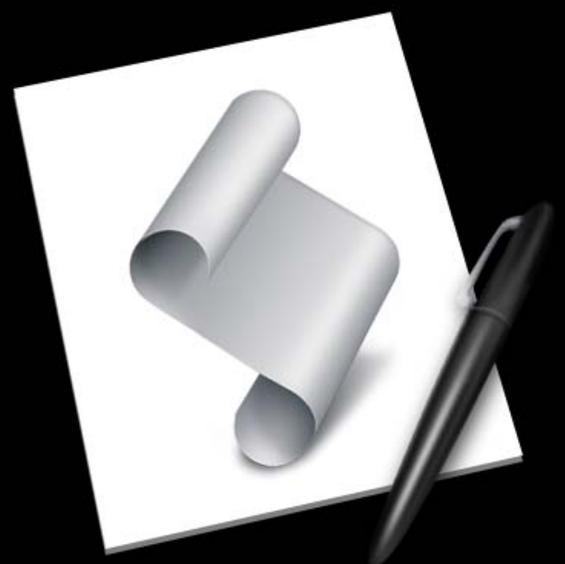
Get the Web

1. Write some code
2. Google some examples
3. Tweak
4. Write some more code
5. Google some more
6. Tweak some more

AppleScript

A GUI scripter and oh so much more!

http://developer.apple.com/wwdc2005/



AppleScript

- Started off as a language to control other apps
- Fully functional in its own right
- Closest to spoken English
- In the OS since System 7

AppleScript Advantages

- Primarily the only GUI scripting language
  - Scriptable apps
  - GUI scripting
- Easy to pick up
- Spoken English syntax—easy to learn
- AppleScript Studio—easily allows a GUI
- Recordable—gets you started with the basics

AppleScript Disadvantages

- Spoken English syntax—sometimes annoying to write a script in
- Single threaded
- Only on the Mac—can’t deploy on other platforms

Sample AppleScript

This checks for not enough free space

```
tell app "Finder"
  if (free space of startup disk) < 1.0E+9
then
     empty trash
     beep
     display dialog "Ack, I feel full!"
     say "Need more room"
  end if
end tell
```

AppleScript Studio Demo

pwpolicy GUI

Josh Wisenbaker
AFP548.com

http://developer.apple.com/wwdc2005/

AppleScript Demo

Software update system

Josh Wisenbaker
AFP548.com

http://developer.apple.com/wwdc2005/

Interaction with Shell Commands

- Do Shell script
- Changed slightly in Tiger—don't use "sudo"

```
tell application "Finder"
   set lastuser_temp to do shell script "last -1"
   repeat
      set lastuser to do shell script "last -1"
      if lastuser is not equal to lastuser_temp then
         set lastuser_temp to lastuser
         set login_name to first word of lastuser as text
         say first word of lastuser as text
         say "just logged in"
         delay 2
      end if
   end repeat
end tell
```

Shell

Just like the command line!

http://developer.apple.com/wwdc2005/

Shell

- Built-in scripting function of the Shell
- One of the oldest forms of scripting
- Years and years of sample scripts available

Shell Advantages

- Just like the Command Line—only automated
- Simple—if you can use the CLI, you can script it
- Very few terms—easy to pick up
- Relatively portable—most Unix shell scripts will work on OS X with little or no modification

Shell Disadvantages

- No GUI—have to use AppleScript
- Hard to do some Shell functions—those that require interaction
- Check your Shell—not all shells can do the same things
  Make sure you specify the one you actually want

Simple Mail Server Backup

- No error handling
- No restore functionality
- Does the job

```
#!/bin/bash

logger "beginning mail backup"

/usr/sbin/serveradmin stop mail

/usr/bin/rsync -az /var/spool/imap /Volumes/XRAID/Backup
/usr/bin/gnutar -czv /etc/postfix > /Volumes/XRAID/post.tgz

/usr/sbin/serveradmin start mail

logger "finished mail backup"
```

Automated Xserve Cluster Installer

Shell script automated installation

Joel Rennich
Apple

http://developer.apple.com/wwdc2005/

Cheesey SoUp

Shell-based software update system

Joel Rennich
Apple

http://developer.apple.com/wwdc2005/

Interaction with AppleScript

Osascript

```
#!/bin/bash

MY_PATH=`osascript /Applications/PathScript.scpt`

echo $MY_PATH
```

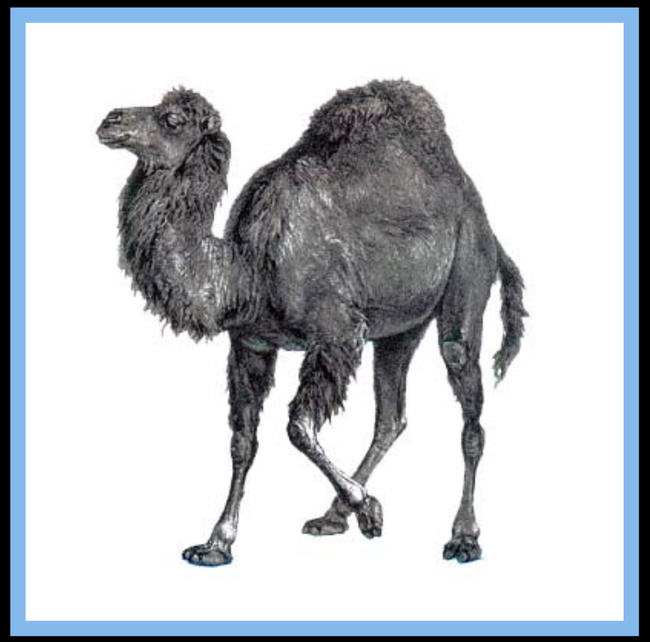
```
tell application "Finder"
  activate
  set mylocation to choose file with prompt "Please select your Application"
     of type "APPL"
  set mypath to POSIX path of mylocation
  return mypath
end tell
```

Perl

Never use another scripting language

http://developer.apple.com/wwdc2005/

Perl



- Present on all *nix systems
- Many many perl resources available
- Very active developer community

Perl Advantages

- Multi-threaded—can do many things at once
- Most extensible of the three languages—thousands of modules have been contributed
- CPAN
- Runs on the most systems—even OS 8 and Windows
- Incredibly good for text processing—regular expressions are integral to perl
- There's more than one way to do it

Perl Disadvantages

- Most complex of the languages—partly because it can do so much
- Highest learning curve—you'll actually have to think about when writing perl for the first time
- There's more than one way to do it

Simple Perl Script

```
#!/usr/bin/perl -w

use POSIX 'setsid';

daemonize();

system ("ssh -l $ARGV[0] $ARGV[1] -C -p $ARGV[2] $ARGV[3] $ARGV[4] sleep $ARGV[5]");

sub daemonize {
    chdir '/'                 or die "Can't chdir to /: $!";
    open STDIN, '/dev/null'   or die "Can't read /dev/null: $!";
    open STDOUT, '>/dev/null' or die "Can't write to /dev/null: $!";
    defined(my $pid = fork)   or die "Can't fork: $!";
    exit if $pid;
    setsid                    or die "Can't start a new session: $!";
    open STDERR, '>&STDOUT'   or die "Can't dup stdout: $!";
 }
```

Customizing New Home Folders

Using Perl to set default settings

Joel Rennich
Apple

http://developer.apple.com/wwdc2005/

Python

Named after the comedy group

http://developer.apple.com/wwdc2005/

Python

- Present on all *nix systems
- Newer language that’s quickly becoming quite popular
- Very active developer community

Python Advantages

- Very easy to get started with
- Very easy to read someone else's code
- Object-orientated
- Can interact with Cocoa and Carbon APIs
- Very loosely typed

Python Disadvantages

- Not installed by default on many systems
- Still “new” so not as many sample scripts and web resources available
- Not quite as easy as shell or Applescript

Simple Python Script

```
#!/usr/bin/python

import os

mydisks = os.popen("diskutil list").readlines()

print mydisks
```

ShrubberySoUp

Build your own software update system

Andrina Kelly
AFP548.com

http://developer.apple.com/wwdc2005/

For More Information

http://developer.apple.com/wwdc2005/

Documentation, Sample Code, and Other Resources

http://developer.apple.com/wwdc2005/

Q&A

Joel Rennich
Consulting Engineer
Apple Enterprise Consulting Services

http://developer.apple.com/wwdc2005/

WWDC2005

Worldwide Developers Conference